City of Bellevue Submittal Requirements	**68**

Seismic Bracing
MEP, Sprinkler, Fire Alarm & Smoke Control System Components

7/08/09

If you have any questions concerning your application, please visit or call the Building Desk in the Development Services Center (425-452-4121) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Assistance for the hearing impaired: dial 711.

Interpretations & Procedures

Code: 2003/2006 IBC & ASCE 7-05 & Errata
Section: 2006 IBC 1613 & ASCE Ch. 13

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1. Structures with (I_p) = 1.0: The attached Table A, specifies the City of Bellevue approved seismic bracing requirements. [Importance factor (I_p) as defined in ASCE 7-05]
2. Structures with $I_p > 1.0$: All projects with $I_p > 1.0$ require an engineered design of seismic bracing systems for all mechanical (M), electrical (E), plumbing (P), sprinkler (S)[j], fire alarm (FA), and smoke control (SC) system components when the system component has been assigned an I_p of 1.5. The component I_p shall be taken as 1.5 if any of the following conditions apply.
   a. The component is required to function for life-safety purposes after an earthquake, including fire protection sprinkler systems.
   b. The component contains hazardous materials.
   c. The component is in or attached to an Occupancy Category IV structure and it is needed for continued operation of the facility or where its failure could impair the continued operation of the facility.

Table A – Guidelines for System Component Seismic Bracing where $I_p = 1.0$

	Ducts & Piping	**Equipment < 75#**	**75# < Equip ≤ 400#**	**Equip > 400#** [n]
Mechanical Ductwork	SMACNA [i] Details/Spacing	N.A.	N.A.	N.A.
Gas and Hydronic Piping	SMACNA [i] Details/Spacing	N.A.	N.A.	N.A.
M, E, P, equip mounted ≤ 4' above the floor/roof & mounted with flexible connections [a, b, c]	N.A.	No Requirement	No Requirement	Engineering for gravity and lateral support [d, e, g] (plan review required)
M, E, P, equip mounted > 4' above the floor/roof [a, c]	N.A.	No Requirement	Engineering for gravity and lateral support [d,e,g] (field approve)	Engineering for gravity and lateral support [d,e,g] (plan review required)
M, E, P equip mounted with flexible connections. [b, c]	N.A.	N.A.	N.A.	N.A.
M, E, P equip mounted from a wall or suspended from structure [f]	N.A.	N.A.	Engineering for gravity and lateral support (field approve)	Engineering for gravity and lateral support (plan review required)
Plumbing Piping (drain, waste, & vent)	Per UPC	N.A.	N.A.	N.A.

a. 4' dimension measured from the floor to the mounting point location.
b. Mechanical, electrical and plumbing components with flexible connections installed between the components and associated ductwork, piping, and conduit.
c. Water tank restraints required per UPC Section 508.2.
d. Engineering for gravity not required when mounted at slab on grade
e. Engineering for lateral not required when the height/width ratio is ≤ 1.0 (In all horizontal directions)
f. Engineering shall address the bracing system, the point(s) of attachment, and the capacity of the building element or structure supporting the attachment and bracing system.
g. Rooftop equipment: Change out weight like for like, no engineering required. New units with weight exceeding 5% of original, engineering required for gravity (IBC Section 3403.2).
h. Water heaters ≥ 60 gallons will fall under this category
i. SMACNA Restraint Manual "Guidelines for Mechanical Systems": 2nd Ed, Feb. 1998, 2006 Uniform Plumbing Code Table 3-2
j. Seismic bracing for fire protection sprinkler systems in seismic design category D-F designed per NFPA 13 as specified in ASCE 7-05 Section 13.6.8.3